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Table of Contents

Chapter 1 Preface	1
Chapter 2 Summarize of the Product	5
2.1 Purpose Summarization.....	5
2.2 Brief Description and Block Diagram of The Working Principle	6
2.3 Typical Framework of the System.....	7
2.4 Functions	8
Chapter 3 Primary Technical Index	13
Chapter 4 Installation and Startup of the system.....	16
4.1 Request of Computer Configuration	16
4.2 Link between Sending Onstrument and Electrode	16
4.3 Device Turn on/Turn off.....	17
Chapter 5 Description of Functions	18
5.1 Main Interface	18
5.2 New Exam	19
5.3 The Problem Related to The Skin and The Electrode	38
5.4 Review.....	48
5.5 Replay.....	55
5.6 Average Review.....	57
5.7 Event Review	64

5.8 Review Trends	66
5.9 Archive Management.....	70
5.10 Protocol.....	79
5.11 Configuration Settings	83
5.12 Utilities	95
Chapter 6 Instructions to Attendants.....	96
6.1 Patient Skin Dispose.....	97
6.2 Electrode Emplace	98
6.3 Exercise Protocol and Configuration Setting ..	100
6.4 New Exam	101
6.5 Input of Patient's Information	102
6.6 Formal Data Sample	103
6.7 Final Report	105
Chapter 7 Attention.....	106
7.1 Installation	106
7.2 Action.....	106
7.3 Maintenance.....	107
7.4 Transport and Storage	108
7.5 Disposal of Product Scrap	108
7.6 Others.....	109
Chapter 8 Malfunction and Maintenance	110
Chapter 9 Precautions	116

Chapter 1 Preface

Welcome to use Stress ECG Analysis System!

The device adopts advanced design thought and foreland electron communication technique. Its friendly interface and convenient operation will provide great help to your work.

⚠️ Notice: Please read user manual carefully before using the instrument, and operate it according to the user manual's request

The user manual introduce detailedly the operation steps that you need to pay attention to when using the device, operation that maybe lead abnormality, danger that maybe hurt the device or person and so on, refer to every chapter for details. Any abnormality or person and machine harm that do not according to the user manual to use, maintenance or store, we are not responsible for security, reliability and performance. Neither we are free for servicing.

The user manual is written for the current product. In case of modifications and software upgrades, the information

contained in this document is subject to change without notice.

(1) Caution

Please consider the safety and validity as follows before using the instrument:

- The instrument's security defense type is Type CF(Chest electrodes, Limb electrodes), internally powered.
- The system should be operated by professional doctor.

The each measure result, should be described by the professional doctors combined with clinical symptoms.

- The reliability of using the instrument lies on whether the operation and maintain is according to this manual.

The particular content about clinic restrict and contraindication of sport test, please refer to relational medicine literature carefully.

⚠️ Notice: If you change any accessory, which is not provided by our company, it will cause system error.

Any maintenance man without authorization of our company or other maintenance organization recognized by our company should not try to maintain this instrument. It is forbidden to refit the device.

(2) Operator duty

- The system must be operated or maintained by professional doctor, and be kept by special person.
- Operator must read the manual thoroughly before operating the instrument, and follow the operate rules strictly.
- The system has fully considered the security request in design. However the operator should not neglect nursing and observation to patient.
- It is operator's responsibility to provide the using condition of this instrument to our company.

(3) The duty of our company

- Our company provide eligible product according to the enterprise standard.
- Our company will install and debug the product, and train the operator technically.

- Our company be responsible for maintenance of product.
- Our company be responsible for the solving customer's question.

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Chapter 2 Summarize of the Product

2.1 Purpose Summarization

The Stress ECG Analysis System is consist of sampling hardware device, special software and exercise equipment etc. Its functions include 12 leads ECG synchronously sampling, saving the data of the whole exercise process, ST segment of the whole exercise process, ECG review/replay/average review of the whole exercise process, Multiple trend chart analysis, and multiple printable report etc.

The patient's exercise state can be recorded, the heart exercise function can be showed. Then doctor can get reliable advice in diagnoses.

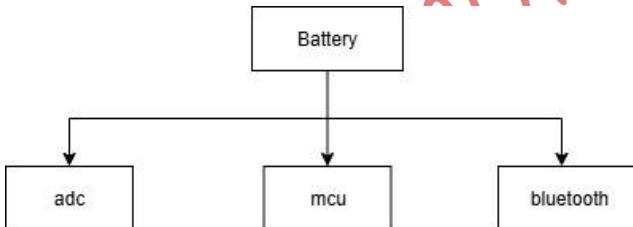
The device is used in hospitals or professional medical institutions. Medical personnel with professional technical training can use this device to collect and record ECG signals of human body.

The device is suited for teenagers,adults, age 12-87.

2.2 Brief Description and Block Diagram of The Working Principle

2.2.1 The power supply unit

The battery in the device can independently complete working requirements of each module in the device through the buck-boost circuit.

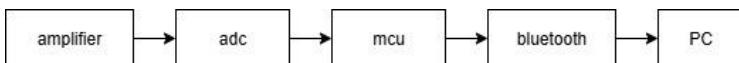


2.2.2 Signal acquisition unit

The signal acquisition unit uses a floating setting, which is a signal acquisition and processing system, including analog circuit part and A/D conversion and data processing part with sampling accuracy of 24 bits. The analog circuit consists of signal following, amplification, anti-aliasing low-pass filtering, lead-off detection and overload detection. CPU system is responsible for coordinating the work of each circuit such as the A/D

ECG-8000S Stress Analysis System Summarize of the Product

converter, the lead-off detection circuit and the overload detection circuit, completes signal acquisition, processing, and lead-off detection.



Note: The principle block diagram and component list are only available to service station or maintenance personnel designated by our company.

2.3 Typical Framework of the System

The typical framework of the Stress ECG Analysis System

Fig.2-1

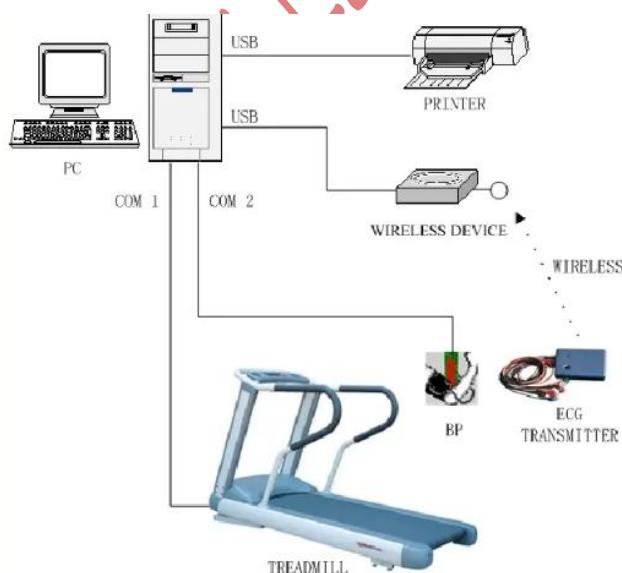


Fig.2-1 Typical framework of the system

The special software system run on the host computer which installed Microsoft Windows operating system. The wireless device is connected to the host with the USB port. The exercise device (eg. treadmill) is connected to the host with a serial port. The stress blood pressure device is connected to the host with a serial port. In an exam, the patient should wear the sampling hardware and the stress blood pressure device, exercise on the exercise device, then the host can get ECG data from the transmit box through wireless mode, and get blood pressure data from the stress blood pressure device, and control the devices at the same time.

⚠ Notice: Stress blood pressure device is optional.

2.4 Functions

- 12 leads ECG cable for data collection and analysis simultaneously. QRS waveform which distinguished by high precision. The cardiograph during collecting data can be Printed out on-line.

ECG-8000S Stress Analysis System Summarize of the Product

- Memorizing and saving whole course cardiograph data simultaneously.
- The change of ST segment during collecting data can be observed in the course of collection. The segment which the operator chooses can be Magnified, and the ST segment data can be automatically calculated.
- Advanced original creation of screen waveform antijamming technology is adopted, which make the screen waveform much more precise, the detail of cardiograph much more exact.
- Anti-jamming technology is adopted to ensure the stabilization of the baseline, reducing effect on cardiograph from myoelectric jamming, baseline excursion, and industry electric wave jamming.
- The machine can adopt both standard exercise scheme and user-defined exercise scheme, and setting instantaneous print and batch print mode.
- Operator can mark events during exercise, the marked event cardiograph waveform can be compared with current waveform, the event can be observed, edited and printed.

ECG-8000S Stress Analysis System Summarize of the Product

- Enriching the display and print of all kinds of trend chart. Mainly including: HR, BP, METS, HR*BP, exercise trend, ST segment level/influence/slope/3D/I level and ST/HR, etc. The provided trend graph includes: line graph, column diagram, influence graph and grid chart.
- Dynamic record after exercise function is provided, it can replay the whole exercise testing process. During the course of replay, the speed can be adjusted, such as speedup, slowdown, pause and skip.
- With static Review function, user can look up ECG waveform of any time, and modify the attribute of QRS complex
- Powerful case management function is provided, including advanced search of archives, modify case info, delete archive, update archives etc.
- Perfect Import/Export case function is provided. The exported cases is compressed, which exhaust less disk space. The compressed case is associated with the operation system file type. This design make the import operation much more simple and quickly.

ECG-8000S Stress Analysis System Summarize of the Product

- System setting functions include several setting items. For example, switching Chinese/English language, format and mode of displaying waveform (12 leads * 1screen / 6leads * 2screens / 3 leads * 2 screens / 3 leads * 1screen, etc), the color of background grid and print setting, filter setting, and displaying of optional parameters, etc.
- The system has friendly interface, multiple info can be presetted according to users' operating habit, including: IME, tool tips, and doctors' information. Latest setting will be memorized and auto saved as "operator's favorite setting". Then the settings can be recovered as start up next time.
- Several useful tools are provides, which are used for equipments management, cases information management and some other operations.
- The wireless cardiograph date collect equipments improve the anti-jamming capability of instrument. And the system is compatible with the wired cardiograph data collection equipment.

ECG-8000S Stress Analysis System Summarize of the
Product

- Built-in battery opposite-connected protecting circuit, although the battery is opposite-connected, it can do no harm to any equipment.
- Lead off detecting function, which makes the working state of the equipment clearer to users.
- The system has the function of defibrillation protection.

Chapter 3 Primary Technical Index

1. Equipment Security Type: Internally powered equipment and Type CF applied part
2. Input Leads: standard 12 leads (10 electrode)
3. Input mode: floating and defibrillation protection
4. Common Mode Rejection Ratio (CMRR): >89dB
5. Direct currents in patient-electrode connections: < 1uA
6. Calibration voltage: 1mV
7. Input loop current: ≤0.01uA
8. Input impedance: ≥2.5MS
9. Noise level: ≤30Vp-p
10. Frequency response:

Test	Rated Input Amplitude	Input frequency and waveform	Relative output response
A	1.0	0.67Hz~40Hz, Sine wave	+5%, -10% ^a

ECG-8000S ECG Stress Analysis System
Technical Index

Primary

D	1.5	$\leq 1\text{Hz}, 200\text{ms}$, Triangle Wave	+0%, - 10% ^b
^a Relative to 10Hz ^b Relative to 200ms			

- 11 Sampling frequency: up to 1000 Hz
- 12 Sampling accuracy: up to 24-bit
- 13 Polarization voltage: $\pm 300 \text{ mV}$
- 14 The minimum detection signal: 10 Hz, 20 uV(peak-peak value) deflected sinusoidal signal can be detected
- 15 Amplitude quantization: $\leq 5\text{V}/\text{LSB}$
- 16 Interchannel time deviation: $<100 \text{ us}$
- 17 Transmitter Power Supply: 2AA alkalescence batteries
- 18 Communication mode: Bluetooth
- 19 Work Environment Demand:
- Temperature: $+5^\circ\text{C} \sim +40^\circ\text{C}$
- Relative Humidity: 25%~95% (no condensation)
- Atmosphere Pressure: 700hPa ~ 1060hPa

20. Keep Environment Demand:

Temperature: -20°C ~ +55°C

Relative Humidity: ≤95%

Atmosphere Pressure: 500hPa ~ 1060hPa

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Chapter 4 Installation and Startup of the system

4.1 Request of Computer Configuration

CPU: Intel(R) Pentium(R) CPU G645 @ 2.90GHz or advanced

EMS memory: 2G or above

Hard disk: 10G or above

Display Card: 512M or above

Printer: 600dpi laser printer

Operating System: Microsoft Windows XP/Windows 7/Windows 8 or above

Resolution: 1024×768

The above settings can be adjusted in the screen attribute of Windows operating system, if you have any question, please refer to the Windows Operating System Help.

4.2 Link between Sending Onstrument and Electrode

Link between sending instrument and electrode as showed in Fig.4-1:

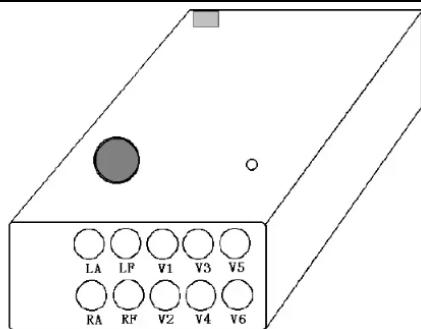


Fig.4-1 Map of linking between Instrument and Electrode

4.3 Device Turn on/Turn off

- Turn on

When needing to turn on the device, press the key on the transmit box for a long time, green indicator light is on and buzzer sound once, then the device will power on.

- Turn off

When needing to turn off the device after finish the body examination, press the key on the transmit box for a long time, the indicator is off and buzzer sound once, then the device will power off

Chapter 5 Description of Functions

⚠ Notice: During the System running, other programs shall not be opened or visited. It is strong recommended not to run screen savers and other computer programs, which will move focus from Stress ECG Analysis System in the settings of Windows Operation System.

5.1 Main Interface

Start the System by double click the icon of Stress ECG Analysis System on the desktop. After the System startup, system enters the Main interface application, as the Fig.5-1 shows.



Fig.5-1 Main Interface of the System

Main interface include:

- Quick Open: choose the former case from drop list, then click the button on its right side, and enter Report edit interface of the corresponding case (as Fig.5-22).
- Total Archives: Shows total of current usable Cases, not including the deleted cases. The number is the total of existent cases. Blue background represents the used disk space, white represents the unused disk space.
- New exam: click this button to enter a new examination interface (as Fig.5-2).
- Archive: click this button to enter Archive management interface (as Fig.5-33).
- Protocols: click this button to enter Protocol Settings interface (as Fig.5-41).
- Settings: click this button to enter Configuration Settings interface (as Fig.5-44).
- Utilities: click this button to enter Utilities interface (as Fig.5-51).
- Exit: click this button to exit the Stress ECG analysis System.

5.2 New Exam

Click "New Exam" button, enter the new examination interface, to begin a new exercise stress ECG exam.

5.2.1 Pre-Sample State

First enter Pre-Sample state, as Fig. 5-2.

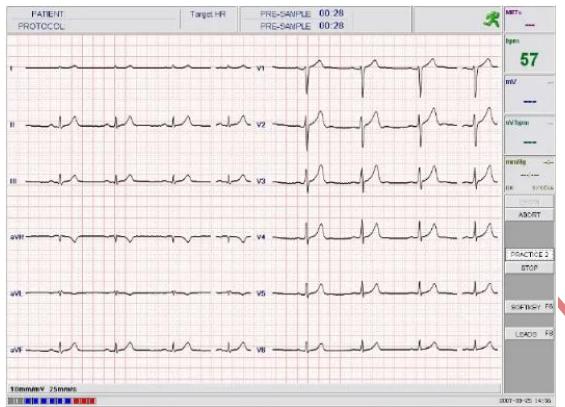


Fig.5-2 Pre-Sample

The interface including following items:

Basic information area: patient name, current protocol and Target HR.

Testing process area: testing time, stage time, exercise equipment state and current stage.

Leads off information area: Display the information of Leads off.

ECG area: Display the ECG signals which get from transmit box currently.

Parameter: estimate metabolize quantity, heart rate (includes heart rate percentage), ST segment of selected Lead and blood pressure etc.

Control area:

Begin: Click the button and input the patient information, then enter sampling interface.

Abort: Back to main interface

Practice: Patient do adaptability practice on the Exercise device under advice of the doctor, so that the patient can do exercise smoothly in the sampling course, and we can receive more reliable data.

Stop: Stop practice button is only enable at Practice stage, Sampling can not begin before stop practice.

Softkey: Click the button, a prompt window shows up. In it, ECG Gain, ECG Speed, anti-aliasing option, and wave filter can be set. Please refer to the following chapter for details.

Leads: Main analysis Lead can be set. The default main analysis lead is "V5".

⚠ Notice: The dialog box in Fig.5-3 occurs when the check of exercise equipment failed.

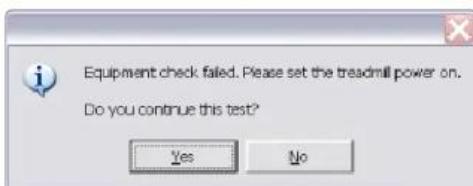


Fig.5-3 Check of exercise equipment failed

If the failure is because exercise equipment power is turn off, please turn on the power supply. Otherwise see the "**Malfunction and Maintenance**" for reference please.

Choose "**Yes**" to continue new test, choose "**No**" to stop test, and back to main interface. The result is the same as "**ABORT**" button, which under this interface.

⚠ Notice: The dialog box in Fig.5-4 occurs when the check of exercise blood-pressure meter failed.

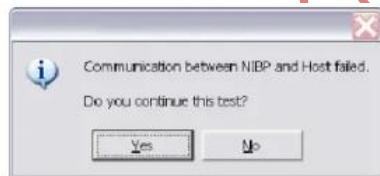


Fig. 5-4 Check of exercise blood-pressure meter failed

If the failure is because exercise blood-pressure meter power is turn off, please turn on the power supply. Otherwise see the "**Malfunction and Maintenance**" for reference please.

Choose "**Yes**" to continue new test, choose "**No**" to stop test, and back to main interface. The result is the same as "**ABORT**" button, which under this interface.

⚠ Notice: When entering the interface, the dialog box in Fig.5-5 occurs if check of transmitter fails.

This failure as Fig.5-5 may be caused by two reasons.

First, Transmitter is out of power;
Second, the Transmitter is out of available range of wireless device.

If it is because of the first reason, please fix battery, and if it is because of the second reason, please move the transmitter into the available range of wireless device.

Click "Yes" to continue new test, and click "No" to stop, and back to main interface. The result is the same as "ABORT" button, which under this interface.

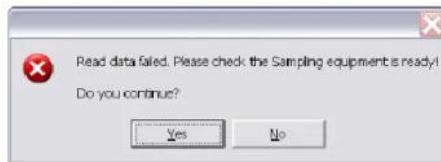


Fig. 5-5 Check of the transmitter failed

⚠ Notice: The displaying ECG and blood pressure data are not saved before click "start" button. Current state is designed for operator to check the result of placed leads, whether the system run smoothly, and tutor the patient to do necessary adaptability practice.

⚠ Notice: Before sampling, set "Wi-Fi receiver" as accept device in system setting of option setting interface, please note the following:

1. When enter the interface shown in Fig.5-2, prompt of connecting to the Wi-Fi device will show, if can not connect, will show prompt box, please connect again; if connected, then enter the pre-sampling state.
2. The battery icon shows on the right of the Metabolize quantity in parameter display area, as Fig.5-2.
3. When enter the interface as Fig 5-2, prompt of replacing the battery will show, if the battery isn't enough to sample a whole case.
4. During sampling process it may be failing to read the data if Bluetooth connection is bad, a dialog box will pop up to remind you to restart the device.

5.2.2 Input Patient Data

In the state of Pre-Sample, click the "start" button, Patient data dialog box occurs as Fig.5-6. You can input the following information:

- ID
- Section
- Name
- Sex
- Race
- DOB

- Age
- Target heart rate: The target HR can be calculated automatically according to patient's age, calculate formula can be amended in "**Configuration settings**".
- Height
- Weight
- Address
- Telephone
- Smoking
- Diabetes
- History of myocardial
- Hypertension
- Hyperlipidemia
- Family diseases history
- Operator
- Physician
- Indication
- Medication
- Notes

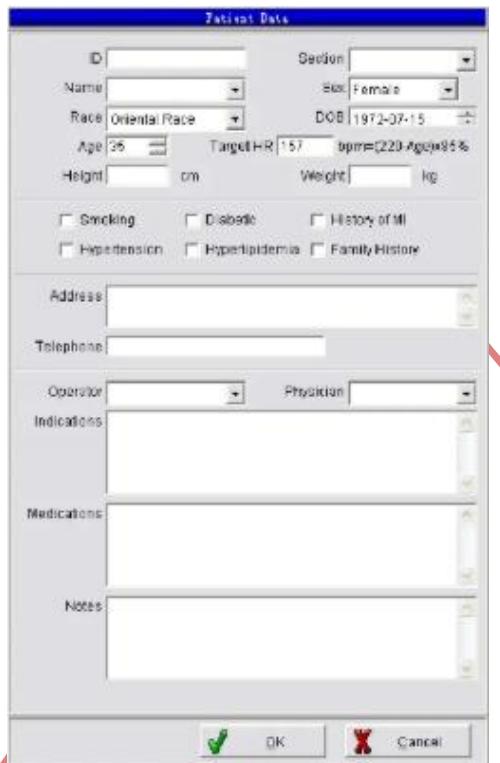


Fig.5-6 Patient Data

⚠ Notice: Target HR can not be blank, others can be blank.

Click "OK" button after fill in the patient data, and then enter sampling interface. Click "Cancel" button back to the pre-sample preface.

5.2.3 Sampling State

The interface sampling is different from the interface of pre-sample, as Fig.5-7:

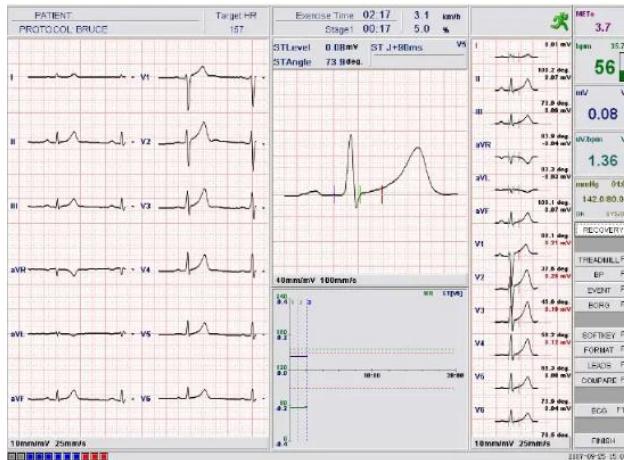


Fig.5-7 Sampling Stage

5.2.3.1 Content of Fig.5-7

- Patient: patient's name shows here
- Protocol: this is the exercise protocol in use.
- Exercise time: exercise time starts from 00:00, till this test finish.
- Stage: here is the name of exercise stage.
- Stage time: Tied in with every stage time, at the beginning of every stage or when the load is changed manual, the time will restart from 00:00.
- Speed and gradient of treadmill: Current state of the flat shows here.
- Leads off information: Display the information of Leads off.

- Mets: here is the estimate metabolize quantity
- HR and the percentage of target HR: the ratio is the heart rate percentage of target heart rate.

⚠ Notice: When target heart rate percentage reached 100%, it will be red.

- ST level: Shows voltage of average wave of ST segment of current ST master displaying lead.

⚠ Notice: When ST segment elevation or depression over 0.1mv, there will be a warning icon.

- Blood pressure: display the last input or acquired blood pressure. Format: SYS/DIA. The time acquired BP data is showed at the top right corner. The state of the BP meter is at the bottom left corner, "OK" means the equipment is all set, blood pressure can be measured, "BUSY" Means the equipment is busy now, blood pressure can not be measured, and the blood-pressure data can be entered manually.

⚠ Notice: The state at the bottom left is valid when the blood-pressure equipment is available.

⚠ Notice: If receiver is set as "Bluetooth receiver", the battery icon will show on the right of the Metabolize quantity in parameter display area, as Fig.5-7.

5.2.3.2 Operation items

- Exercise stage

There is different title during different stage (pre-exercise stage, exercise stage, recovery stage), including "Run" and "Recovery".

At pre-exercise stage, there is a button of "Run", click it to enter first step of exercise stage.

At exercise stage, there is a button of "Recovery", click it to enter the first step of recovery stage.

- Treadmill

Click button "Treadmill", treadmill control dialog box occurs as Fig.5-8:

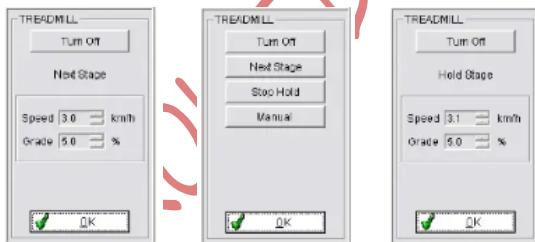


Fig.5-8 Treadmill | Fig.5-9 Turn Off | Fig.5-10 Turn On

1. Turn off:

Setting the speed and gradient at 0, which have the same function as urgency detent button. Click "Turn off" button, a dialogue box as Fig.5-9 occurs, click button "OK", to lock the movement of treadmill.

When the treadmill is locked, click button "Treadmill" again, a dialog as Fig.5-10 occurs, click button "Turn On", and then click

button "OK", the treadmill will back to the former state of speed and gradient.

2. Next stage:

Set the scale of speed and gradient of next stage of exercise protocol. It will finish current stage ahead of schedule, enter next step. For example, if the operator wants to overlap several preceding exercise stage in protocol, click "next stage" button Dialog box of Fig.5-8, dialog box in Fig.5-11 occurs, then click button "OK".

3. Keep current stage:

Keeping or prolong any independent stage of exercise. For example, in the precondition of former protocol, operator need to inspect patient condition when the treadmill kept at certain speed and gradient. Then click "Hold Stage" in Fig.5-8, then the dialogue box as Fig.5-12 occurs, click button "OK" in it.



Fig.5-11 Next Stage | Fig.5-12 Hold Stage | Fig.5-13 Stop Hold

⚠️ Notice: At current condition, speed and gradient display as red character, meaning hold stage operation.

At current condition, method of cancel this operation: click button "Treadmill", then click "Stop hold" in the next dialogue box as Fig.5-13, then click button "OK", the speed and grade region return to former color.

⚠️ Notice: After the operation of cancel keeping current exercise stage, the treadmill back to current phase, only when exercise time reaches prearranged time, next step will begin.

4. Manual: during process of exercise stress test, it is available to adopt manually control speed and gradient parameter, so that we can get more exact result according to patient's ability.

Method: click button "manual" in Fig.5-8, the dialogue box as Fig.5-14 occurs, operator can input certain speed and gradient in it, then click button "OK".

⚠️ Notice: When you choose manual control, prearranged exercise protocol is out of use, exercise test should be operated under manual control mode. After enter recovery stage, prearrange resume stage parameter will become effective to treadmill.

- Blood pressure input

Click button "BP", a dialogue box of blood pressure window pops up as Fig.5-15, this interface is for inputting metrical parameter of blood pressure.

The operator can enter the blood-pressure data directly in the edit box, and click "OK".

When the blood-pressure equipment is available, click "Measure", the window will be closed, and the system will measure blood pressure automatically, the result will be saved and displayed.

- Event

Click button "Event", a dialog box as Fig.5-16 pops up. You can choose or input an event name, then click button "OK", the system will define an event label of this time for comparing during sampling process. The defined event label and its corresponding ECG waveform can be viewed after test in the function of "Event review".



Fig.5-14 Manual | Fig.5-15 BP | Fig.5-16 Event

- BORG grade

Click button "BORG", a dialog box as Fig.5-17 pops out, BORG grade is patient's subjective estimate workload. It measures patient endeavor level. Click button "BORG", then a drop list will show to select patient's endeavor level. This list started from 0 to maximum figure, listing out the various endeavor level. Choose a BORG grade, then click button "OK".

- Softkey

Click button "Softkey", a dialog box occurs as Fig.5-18, including operation of different settings: screen ECG gain, screen ECG speed, waveform display anti-aliasing, power-frequency filter, baseline filter.

1. Screen ECG Gain

Provide gain of ECG displayed on screen, which include: 5mm/mV, 10mm/mV and 20mm/mV. Please choose the one you need from drop list.

2. Screen ECG speed

Provide different speed for ECG on screen, which include: 12.5mm/s, 25mm/s and 50mm/s. Please choose the one you need from list.

⚠️ Notice: No matter what Screen ECG plus and Screen ECG speed adopted, system output average compound wave by 100mm/s and 40mm/mV.



Fig.5-17 BORG | Fig.5-18 SoftKey | Fig.5-19 Format

3. Anti-aliasing of waveform

If this item is checked, the ECG waveform on screen will be displayed in high fidelity, which makes the waveform more accurate, avoid distortion caused by physics character of display screen.

4. PF filter

If this item is checked, ECG electronic signal will be transacted, wipe off power-line interference.

5. Baseline wave filter

If this item is checked, ECG electronic signal will be transacted, reduce base line excursion.

• Format

Click button "Format", a window as Fig.5-19 pop-up, which includes parameter setup about relevant format.

These parameters are ECG format displayed on screen, the color of ECG grid, magnified ST segment main analyze leads, synchronous display.

1. ECG format displayed on screen

Choose ECG format video mode from list, including:

3 leads (3leads*1row), 6 leads (6 leads*1row), 6 leads (3 leads*2row), 12 leads (12leads*1row), 12 leads (6leads*2row),
3leads*1row, 3 leads*2row, 6 leads*1row are enacted in "Configuration settings".

2. The color of ECG grid

Set Background color of ECG displaying on screen.

3. Magnified ST segment main analyze leads

Choose this item, the average compound wave magnified ST segment main analyze leads will be displayed in upper side of middle part on screen, ST segment level and angle of R-ST will be displayed at the same time.

4. Synchronous display

When operator chooses magnified ST segment main analyze leads, last event or movement trend is displayed in downside of middle part on screen. Movement trend includes heart rate and ST segment trend chart (as Fig.5-7), the last event is the ECG waveform of the last event.

● Leads

Click button "Leads", Leads window as Fig.5-20 pop-up, choose needed ST segment main analysis lead from the list, then click

button "OK", to set ST segment analysis and magnified average compound wave lead.

Optional leads including:

1. Choose one of 12 leads, if user does not change it, the selected one will be displayed.
2. Dynamic option: system will choose and display one of 12 leads in turn.
3. Maximum of ST segment depression/elevation: system will choose and display the Maximum of ST segment depression or elevation.

△ Notice: Choose different main analysis lead, because of the each lead QRS complex is different, the R wave is left out due to the low voltage, the measured heart rate may deviate greatly from the correct one, then lead to the measures about ST and so on are imprecise.

△ Notice: The ST segment trend of selected lead as primary analysis lead be displayed in the window of movement trend. Change of primary analysis lead of ST segment setting will take effect next time.

- Compare

Click button "Compare", window as Fig.5-21 pop-up.

The above operation is designed for change parameter, which compares with average compound wave. The parameter be derived from former defined event and collected data in current case, choose one of the item from list, the average compound wave of selected item becomes parameter for comparing. Then current complex will display as the compare waveform displaying. If you want to cancel comparing, choose the blank item on top of list. Click "OK" after setting.

⚠ Notice: The change of parameter become effective when next magnified ST segment main analysis lead waveform display.

- Finish test.

Click button "Finish" to finish sampling process, then enter report edit step.

⚠ Notice: Click button "Finish" at anytime of the exam will finish current exam, and enter report edit interface.



Fig.5-20 Leads

Fig.5-21 Compare

5.3 The Problem Related to The Skin and The Electrode

5.3.1 Report Edit for Single Case

After sampling, choose open archive in archive management, or click button "open" in main interface, we will enter corresponding case edit interface. The interface of report edit is showed in Fig.5-22:

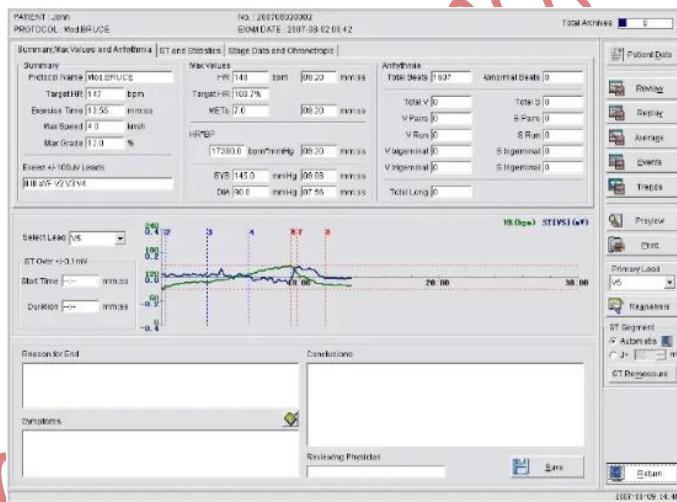


Fig.5-22 Report edit

On the left side of the interface is test summary column, on the right side is operating column.

Test summary column shows statistic analysis result of test.

Summary:

- Protocol Name: The exercise protocol when sampling
- Target HR: The target heart rate of the patient
- Exam time: time between pre-exercise stage and the end of recovery stage. Format: "mm:ss".
- Max Speed: the maximum speed of treadmill in process of sampling.
- Max gradient: the maximum gradient of treadmill in process of sampling.
- Lead over $\pm 0.1\text{mV}$: the lead in which ST segment elevation/depression over 0.1mV during sampling process.

Max Values:

- HR: The HR maximum of patient in sampling, and the time when it occurs.
- Target HR: The percentage between heart rate maximum and target heart rate.
- METs: Metabolize quantity maximum during sampling process. And the time when it occurs.
- HR*BP: The HR*BP maximum and the time when it occurs.
- SYS: The patient's systolic blood pressure maximum during test and the time when it occurs.
- DIA: The patient's Diastolic blood pressure maximum during test and the time when it occurs.

- Arrhythmia: the analysis result of arrhythmia, including: total heart beat number and times of different kinds of Arrhythmia.

ST segment:

- ST segment elevation maximum: during formal sampling process, patient's ST segment elevation maximum, its time and leads.
- ST segment depression maximum: during formal sampling process, patient's ST segment depression maximum, its time and leads.
- ST segment elevation change maximum: during formal sampling process, compare to pre-exercise stage, patient's ST segment elevation maximum, its time and leads.
- ST segment depression change maximum: during formal sampling process, compare to pre-exercise phase, patient's ST segment depression maximum, its time and leads.
- ST segment up slope maximum: during formal sampling process, patient's ST segment up slope maximum, its time and leads.
- ST segment down slope maximum: during formal sampling process, patient's ST segment down slope maximum, its time and leads.

- ST/HR elevation maximum: during formal sampling process, patient's ST/HR elevation maximum its time and leads.
- ST/HR depression maximum: during formal sampling process, patient's ST/HR depression maximum its time and leads.

Stage Data and chronotropic:

- Test Result: Heart Rate and Blood pressure of every stage during formal sampling process.
- Angina Index: As a parameter of Duke Score, fill in manually.
- Duke Score: A Score index acquired after exercise test of BRUCE protocol. Fill in manually.
- FAI%
- HR recovery
- HR reserve
- MET reserve
- Chronotropic

⚠ Notice: Arrhythmia data, Angina Index, FAI%, HR recovery, HR reserve, MET reserve, Chronotropic and ST segment trend chart are just for reference, not appear in the printed summary report.

Information of test conclusion is at the left side:

- Reason for end: reason for end of the test, according to the fact it can be exercise protocol finished, reached target heart rate or pernicious arrhythmia, etc. this item should be filled in manually.
- Symptom: patient's symptom during test. This item should be filled in manually.
- Conclusion: Conclusion of test should be filled in here manually
- Reviewing Physician: The Physician's name who fills the report. This item should be filled in manually.

⚠ Notice: All the information can be filled automatically base on the analysis result except: Duke score, FAI%, reason of end, symptom, conclusion, report doctor. About above information, except items of time, other information can be filled or modified manually, after that, click button "save report" to save current result.

- Quick enter terms:

When fill in conclusion, reason and symptom, there are two ways to use Quick input items dialog box.

1. Click the button as  between Reason of End item and Symptoms item, open a dialog box, then choose the term to enter from it, drag the term into appointed edit box. Or click button

"Fill" after choose the term, then the term will be filled in the edit box which has focus on it.

2. Right click the edit box of Reason of End, Symptoms or Conclusions, a menu pops up (as the right figure).

Choose menu item "Input", another menu occurs, choose the item to input from the menu, then it will be filled into the edit box.

Choose the menu item "Font", a font dialog box pops up, and in the dialog, we can set the font of the edit box which has focus on.

⚠ Notice: After the font is changed, click button "Save", to save the setting of the edit box font.

⚠ Notice: The above method of quick enter terms can be used in archive management as the same.

In addition, trending Figure of heart rate and ST segment is on the left side.

1. List of "Select lead" can be used for change lead of displayed ST segment.
2. Item "ST over $\pm 0.1\text{mV}$ ", display whether ST segment of the appointed lead is over $\pm 0.1\text{mV}$, and the duration of it.
3. The horizontal red broken line in the chart means $\pm 0.1\text{mV}$.
4. The vertical broken line means start of stages, the number represents the stage general number in exercise protocol,

gray one is pre-exercise stage, blue one is exercise stage, red one is recovery stage

5. If ST segment over $\pm 0.1\text{mV}$ occurs in current lead, there is red warning stick under corresponding time.
6. The default display time is 30 minutes, if the whole test time is over 30 minutes, a button for page up or page down will occurs at the right corner below trending figure.
7. Click any point in the trend chart, a window will pop-up, which displays the time of that clicked point, heart rate, and parameter of appointed ST segment. This window will close in three seconds automatically.

Operation column at the right side include:

- Patient Data

Click this button, then modify the information in Patient Data window, click button "OK" to save the information, or click button "Cancel" to cancel the modify of the information and close the window.

- Review

Click this button, to enter the whole test ECG review/print interface of corresponding archive.

- Replay

Click this button, to enter the whole test ECG dynamic replay/print interface of corresponding archive.

- Average

Click this button, to browse average compound wave of whole test.

- Events

Click this button, you can browse all events defined during sampling process.

- Trends

Click this button, you can browse/print all kinds of trending chart.

- Preview

Click this button, preview the summary report for test in a new window.

- Print

Click this button, this summarize report will be printed by default printer. If set "synchronous output file" in option setting, system will create a photograph file in appointed format of summary report in appointed position.

- Primary Lead

Choose Primary Lead, for analyzing the process over again.

- Reanalysis

Click this button, system will analyze the ECG data over again, which include: QRS complex identification, creation of average compound wave, ST segment analysis, arrhythmia analysis, etc.

⚠ Notice: Reanalysis operation will lead to the manual saved date be replaced by newly analyzing conclusion, except reason of end, symptom, conclusion, Reviewing physician.

- ST segment

Analysis mode for appointed ST segment:

1. automatic: adjust ST measure point position automatically, i.e. according to different heart rate choose different measure point, click the icon  on its right side, then set the position of the measure point in the pop-up window of ST measure position, or set it in option setting.
2. J+Xms: ST measure point will be fixed as X millisecond after J point, X is the value in the edit box on its right side.

- ST Remeasure

Checked the button, then ST segment will be measured with the selected method. In this process, the following analysis will not be performed again, including: QRS complex identification, creation of average compound wave, arrhythmia analysis.

⚠ Notice: ST Re-measure will lead to manual ST relevant date be instead by new ST analysis conclusion, but other date does not change.

- **Return**

Click this button to return to archives management interface.

Click "ESC" Key we will get the same result.

5.3.2 Report Edit for Multi-case

Select more than one case in the archive management interface, and click "Open", then we will enter the report edit interface as Fig.5-23.

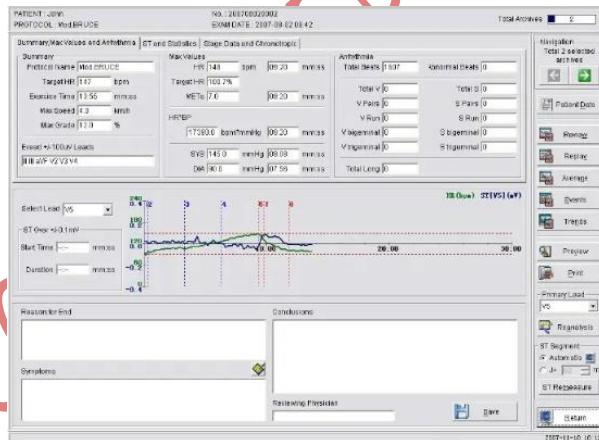


Fig.5-23 Report edit of multi-case

There is "Navigation" area at the top right of the interface. The total of selected archives is displayed here, and click button "Last

"Archive", "Next Archive" To view the report edit interface of the selected archives.

"Last Archive" Button as if the button is as , meaning that the first selected case is displaying.

"Next Archive" Button as , if the button is as , meaning that the last selected case is displaying.

Other functions on the interface are the same as report edit of single case.

5.4 Review

In the Review interface, operator can browse whole ECG waveform, as showed in Fig.5-24:

This interface includes:

- waveform display:

ECG waveform display:

1. Under single lead display mode (as Fig.5-24): top left corner is lead name. Left side of every row of wave is time (format: "min:sec"), vertical scroll bar on right side is designed for examine waveform in different time, scroll bar under the interface is meaningless.
2. Under all leads display mode (as Fig.5-25): time (format: min:sec") is showed on the top left corner, lead name is on the left side of every waveform, under the waveform is periods of

every heartbeat, (unit: millisecond), vertical scroll bar on right side is designed for view waveform of fore-and-aft leads, scroll bar under the interface is designed for view waveform of relevant time.



Fig.5-24 Single Lead Review

~~ONLY~~ **⚠ Notice: Under all leads display mode, if the ECG plus is changed, the 12 leads waveform will be displayed in different screen according to plus. Waveform of other leads can be viewed by drag the vertical scroll bar on right side.**

⚠ Notice: QRS complex marker (red dot) and its attribute abbreviation is only displayed on the top of the main analysis lead, the meaning of the attribute abbreviation is as follows:

N normal (this word will not be displayed)

V premature ventricular beats

S premature atrial beats

L long intermission

O interfere

Del deleted

- Heart rate trend display

The heart rate trend chart displayed is static of average compound wave. The vertical real line in it represent start position of current ECG waveform, click in this chart to display ECG of appointed time.

If the time of sampling is more than the time upper limit to display, the later part will be displayed on the next page. Then there will be page-up and page-down button at the bottom right, click them to view the trend chart.

 means page up;  means page down

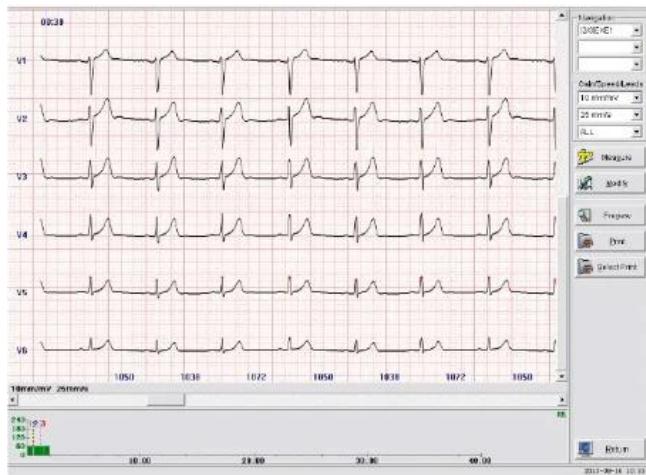


Fig.5-25 Multi Lead Review

~~CONTROLED~~ **⚠️ Notice: To all the trend chart (Except the 3D Trends), when the sampling time is more than the upper limit time to display, the method to view the trend is the same as above.**

- Navigation

This item provides three kinds of Navigation.

1. You can choose different stage from list, then ECG waveform since start of the selected stage will be displayed.
2. You can choose Max HR, Max ST Elevation, or Max ST Depression from list for quick orientation to display corresponding ECG waveform.

3. Choose different arrhythmia in below list, when the ECG wave will go to and show quickly.

- **Gain/Speed/Lead**

This item is designed for adjust ECG Gain, Speed and displayed Lead. If choose "ALL", all leads will be displayed, or only one lead be displayed. Right click waveform display area, you can modify the above settings.

- **Measure**

Click this button, and it will be pressed state, then move mouse to waveform display area, the mouse icon will become a ruler. Press left key of mouse at the start of the waveform to measure, move mouse and a blue rectangle frame occurs (left and right boundary represent beginning and end of time of appointed waveform, top and bottom boundary represent start and end of the swing), move mouse to the end of appointed waveform, loose the left key of mouse, a dialogue box pop-up, as Fig.5-26, including: Time (ms) of blue rectangle frame, height of swing (mV), and heart rate during this period of time. Click button "OK" Or press "ESC" to close the window, for next measure operation or another operation.



Fig.5-26 Measure Parameters

- Modify

Click this button, the button will be in pressed state, then move the mouse to waveform display area, there is a blue rectangle frame around the mouse icon, move the blue rectangle frame to appointed QRS complex, which need be modified, then modify its attribute by keyboard.

N modify as normal

V modify to be premature ventricular beats

S modify to be premature atrial beats

L modify to be long intermission

O modify to be interfere

Del modify as deleted

Move the blue rectangle frame by keyboard:

"up" move the blue rectangle frame upward. This item can be used under single lead display mode

"down" move the blue rectangle frame downward. This item can be used under single lead display mode

"left" move the blue rectangle frame to left, which can adjust rectangle frame.

"right" move the blue rectangle frame to right, which can adjust rectangle frame.

- Preview

Click this button for print preview of current display ECG waveform.

- Print

Click this button, printout the ECG waveform of currently show.

- Select Print

Click this button could select "length each minute" or "length each phase" at the start, middle or end place of ECG waveform to printout.

⚠ Notice: Print preview and print of ECG waveform in this interface is under single lead mode and all leads mode, its plus and speed corresponds with current interface setting.

- Return

Close current Review interface, back to last interface, it can be achieved by press key "ESC", too.

5.5 Replay

When you want the whole sampling process of a test recur, please enter the Replay interface. This function is for recurrence a test sampling process lively, and it is useful for a special stage in exercise test.

When you enter Replay interface, a window as Fig.5-27 occur, then click button "Begin" to start up replaying.

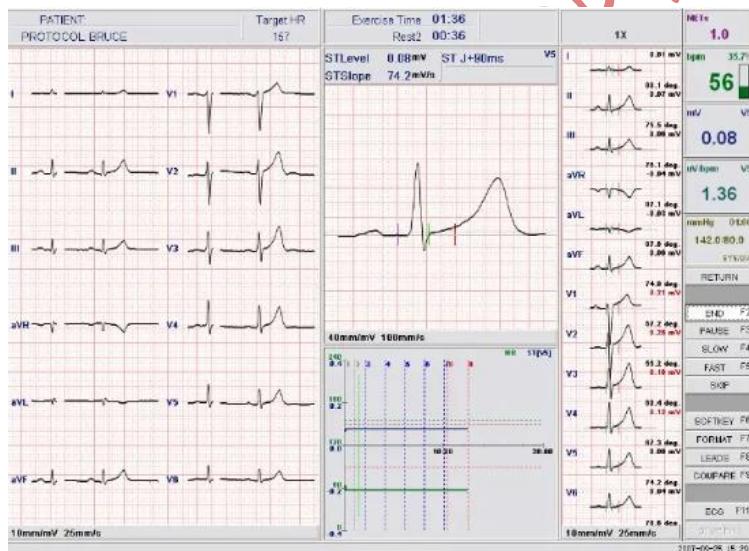


Fig.5-27 Replay

During replay, you can set plus, speed, filter parameter, display format and ST segment lead calculation, etc. moreover, you can stop, pause, restart, speedup and slower retrospect process. These purposes can be fulfilled by clicking following button.

- End: finish replaying
- Pause: Pause during replay, which is available during replaying process.
- Continue: continue replay, which is available when replaying has been paused.
- Fast: accelerate replaying, its maximum is 4 times of real speed.
- Slow: slower replaying, its minimum is 1/4 of real speed.
- Skip: in pop-up window, choose appointed time skip to, then click button "OK".

When you want to back report management interface. Click button "Return".

- Softkey: Same as in sampling
- Format: Same as in sampling
- Leads: Same as in sampling
- Compare: Same as in sampling
- Print: Same as in sampling
- Stop print: Enable when printing

⚠ Notice: In Replay interface, the HR trend view is different from the one in Sampling.

Interface: In Replay interface, There is a vertical green line in HR trend view, it marks the corresponding position in the HR trend view of the replay time.

Function: In Replay interface, Double click the left button of the mouse in HR trend view, the time of replay will jump to the corresponding position of the mouse.

5.6 Average Review

In average review, you can examine, amend, print average compound waveform of whole test process. Its interface is showed in Fig.5-28.

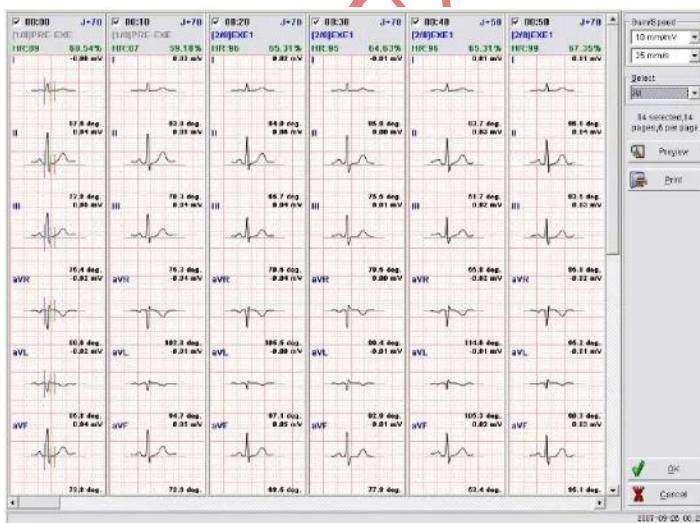


Fig.5-28 Average Review

In the interface, there's 6 columns to display average compound wave, every column includes:

1. Selected state: this button is on top left corner, meaning whether current compound wave be selected. The selected compound wave can be printed by click button "print". Click this button to switch between state of choose or not.
2. Time: on the right of selected state, end time of the compound time. namely, the compound wave is compound of ECG data of the last ten seconds before this time.
3. ST measure point position: the button on top right corner represent the time after J point of current compound ST measure point's.
4. Stage position and name: this item is under the item of Time. In square brackets is the serial number
5. Heart rate and percentage of target heart rate: under item of phase, above waveform display column.
6. Waveform display area: Average compound wave of all leads displays here, and corresponding ST segment, R-ST angle of every lead.
Scroll bar on right side is to view waveform of different leads, scroll bar under the interface is to view waveform of different time.
In every display area, base line position, J point position and ST segment measure point position of average compound waveform

in this display column can be adjusted. Method: click any part out of display area, there will be three vertical line on displaying waveform. They represents as follows:

Blue: base line position

Green: J point position

Red: ST measure point position

Then press key "TAB" on keyboard, you can choose different line, or you can choose it by mouse directly.

Click "left" or "right" key on keyboard, you can adjust position of enabled line, when you can change position of this line, system will display this compound wave and its result. This operation can be completed by dragging mouse, too.

Right click to hide three sign lines.

Setting/control area is on the right side of the interface, including:

- Gain/Speed: this item is for setting of plus/speed of the displayed average compound wave.
- Select: Options of setting selected state of average compound wave listed in the drop down list. The selected average compound wave can be printed by click button "Print". Its options include:

1strip per minute: choose one section from every minute of all average compound wave every during test.

1strip per stage: choose one section from every stage of average compound wave during test

all: all the average compound waves are selected .

all no: None of the average compound waves is selected.

Advanced: Provide advanced mode, through 2 to 4 steps choice, to realize the multi-function auto filter, as Fig.5-29.

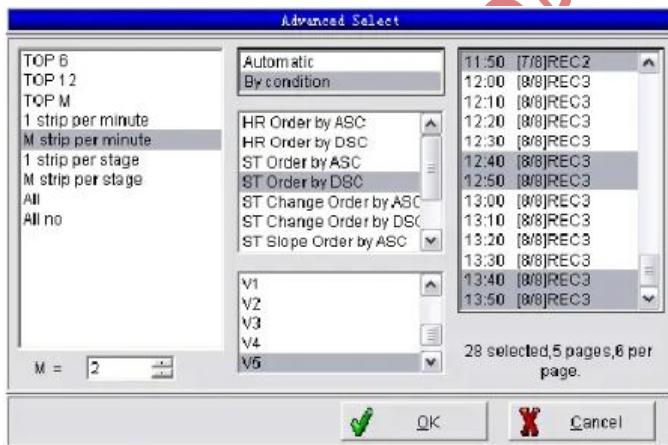


Fig.5-29 Average review-Advanced select

Detailed Operations:

Step 1: Select needed option, options are divided into 3 types.

Type 1 is singularity choice. Including:

TOP6: Select the six average complex on the top.

TOP12: Select the twelve average complex on the top.

1 strip per minute: Take minute as unit, select the top single complex waveform every minute.

1 strip per stage: Take stage as unit, select the top single complex waveform every stage.

Type 2 is multi-select. M value should be input to set the number to select. Including:

TOPM: Unconditionally select the top M average complex waveform. When this item is selected, edit box to input M shows below the list. M is the number of selected complex.

M strip per minute: Take minute as unit, select the top M average complex waveform.

M strip per stage: Take stage as unit, select the top M average complex waveform.

Type 3 is all. It is automatically managed, and is independent of Step 2 and Step 3. Including:

All: Select all the average complex waveforms, the result is shown in the result list on the right.

All No: None of the average complex waveforms is chosen, the result is shown in the result list on the right.

Step 2: Choose filter mode, including automatic choice and by condition choice mode.

Automatic: Automatically choose according to the selected items in step 1. The result is shown in the result list on the right.

By condition: Check this item, and the condition list of step 3 will show up in the dialog box.

Step 3: Select conditions, sort ascending or descending of five items is provided, there are ten items to select, and the lead of all items except heart rate can be selected. The five items are as follows:

HR: According to the items selected in step 1, take the HR as condition of judgment, automatically select the sorted ascending/descending data.

ST: According to the items selected in step 1, take the ST as condition of judgment, automatically select the sorted ascending/descending data.

ST change: According to the items selected in step 1, take the ST change as condition of judgment, automatically select the sorted ascending/descending data.

ST slope: According to the items selected in step 1, take the ST slope as condition of judgment, automatically select the sorted ascending/descending data.

ST/HR: According to the items selected in step 1, take the ST/HR as condition of judgment, automatically select the sorted ascending/descending data.

Step 4: Select lead. When item other than HR is selected at step 3, the lead list will show in the dialog box, it is V5 as default.

- Print preview

Click this button to preview the appointed average compound wave.

- Print

Click this button to print appointed average compound wave by default printer.

- OK

Save modification for baseline position, Point J position, ST segment measure point position, and back to former interface.

- Cancel

Exit and back to former interface, this operation does not save modification for current test. This operation can be fulfilled by button “ESC”, too.

5.7 Event Review

In item of event review, you can review and edit the defined event and corresponding ECG waveform during test process. Its interface is as Fig.5-30 shows.



Fig.5-30 Event Review

There is four event ECG display area on left side, each area includes:

- Event number: on top left corner
- Event label: on top right corn
- Exercise stage and stage time on bottom left corner
- Total time: on middle of bottom

- ECG waveform of 3 leads. In the middle of interface. The displaying lead can be set in option setting.

Click ECG display column of event. This part will be highlight, means this event is selected.

Scroll bar on right-side is designed to view different events

Setup/control item is on the right side, including:

- Gain/Speed: this item is designed for adjusting speed and gain of displayed events.

- Lead: Set 3 leads to display in the window.

- Review: click this button, we will enter the review interface.

Start of the ECG waveform is the time of the first selected event.

Double click on the event display area, we will get the same result. If no event is selected, we can not enter the review interface, a warning dialog box will occur.

- Modify: modify the label of appointed event, click this button, a dialog box pop up to modify the label, click button "OK" finish the modification, or click "Cancel" to cancel the modification. If several events is selected at the same time, the event label will be modified one by one.

- Delete: delete the selected event

- Print preview: Click this button to preview ECG waveform of the selected event.

- Print: Click this button, ECG waveform of the selected event will be printed by default printer.

⚠️ Notice: Print preview and print of ECG wave in this interface is in all leads mode, which is similar to relevant function in ECG Review interface.

5.8 Review Trends

Review trends interface is showed in Fig.5-31:

Trend chart display area is at the left side of this interface. Control area is on the right. Content in trend chart display area changes according to operation in control area, which includes:

- Total trend chart

This item includes: HR Trend, MET's Trend, Speed Trend, Gradient Trend, BP Trend, HR *BP Trend, etc.

- ST level trends

- ST change trends

- ST angle trends

ST angle represent R-ST angle, which is the cross angle of the vertical line and the extended line of point R and ST, which is used for estimating ST state.

- ST/HR trends

- J trends

- Single lead contrast trends

The contrast between above trends of appointed lead.

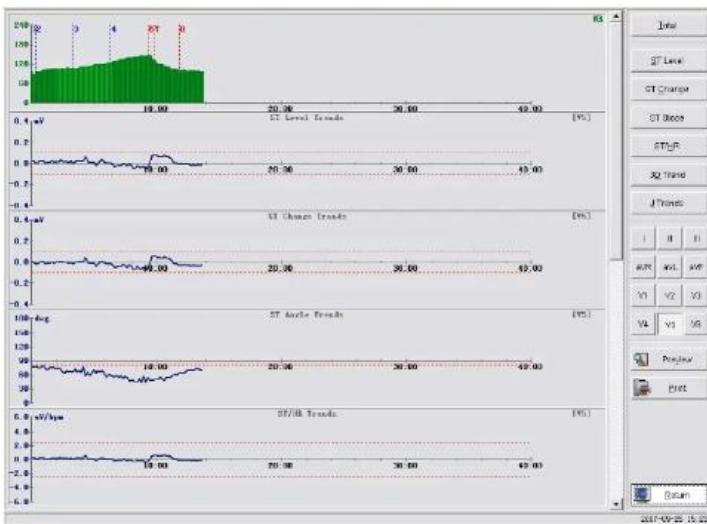


Fig.5-31 Review Trend

EHS-12 ECG Holter System User

- 3D Trend

The interface of 3D trend is as Fig.5-32

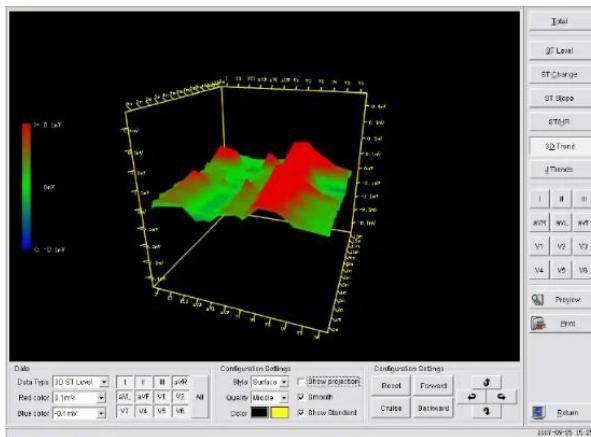


Fig.5-32 3D Trend

- Data type:** 3D ST level, 3D ST change, 3D ST/HR or 3D J level.
- Red Color:** The data that the red color represents.
- Blue Color:** The data that the blue color represents.
- Lead buttons:** Click a button to select the lead to display. The button is checked by default, namely, the lead is selected. Click "All", and all Leads are selected.
- Style:** Select to be Surface or Framework which is consists of curves.
- Color:** Double click the colorized rectangle, a color dialog box pops up, choose the color you want from the dialog

box. The left rectangle is to set the background color, default to be black. The right one is to set the color of font and coordinate, default to be yellow.

- ◆ **Show projection:** Check it to show the projection of the 3D surface on the underside.
- ◆ **Smooth:** Click it to avoid serrate curves.
- ◆ **Show Standard:** Display the meaning of the red, green and blue color (cutline).
- ◆ **Reset:** Back to the first state.
- ◆ **Cruise:** Turning the Trend chart automatically, to examine the detail of the chart.
- ◆ **Forward:** To shorten the distance of the observer and the trend chart, similar to magnify the trend chart.
- ◆ **Backward:** To minify the distance of the observer and the trend chart, similar to magnify the trend chart.
- ◆ **Turn control buttons:**



turn upward;



turn downward;



turn to

the left;



turn to the right

⚠ Notice: In trend chart of ST segment, except 3D Trend:

Click on the chart, a vertical broken line occurs, the numerical value by the line represents the value of the position in trend chart.

Right click on the chart, a vertical broken line will occur in its transverse place, the numerical value by the line represents value of this position in trend chart

Double click, we enter Review interface, start of ECG waveform in the Review interface is corresponding to mouse clicked position on the trend chart.

- **Preview:** click this button to preview the appointed trend chart, which is to be printed out.
- **Print:** Click this button, appointed event ECG waveform will be printed by default printer.

5.9 Archive Management

The interface of Archive Management is as Fig. 5-33:

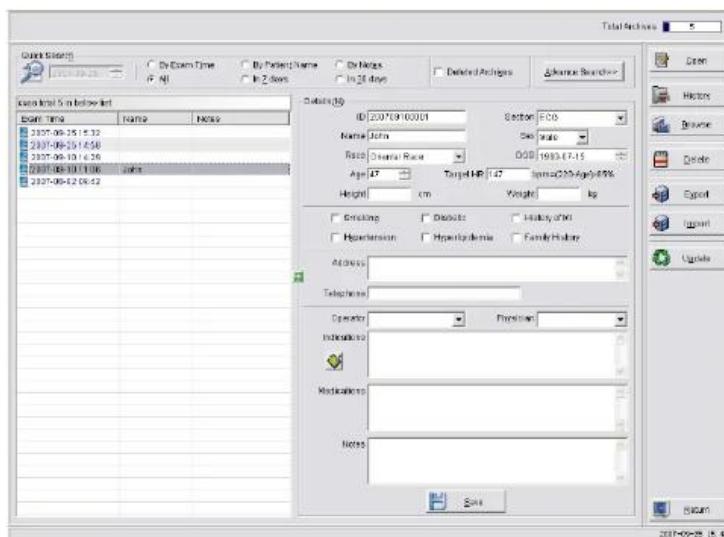


Fig.5-33 Archive Management

This item includes:

- Quick search

Search for appointed case by condition in archive list. Method:
Choose one of the labels "by exam time", "by patient name"
or "by notes", then input appointed condition in the edit box,
the archive list will go to the first record which is qualified.

Search for appointed case in range of time in archive list.
Method: Choose one of the labels "All", "by 7 days" or "by 30
days", then input appointed condition in the edit box, the
archive list will go to the first record which is qualified.

- Delete Archives

- Check this button, then the deleted archives will show on the list. The deleted record is red, and the icon in front of it is different.
- Case list

Cased in the Archive or searched by "advanced Search" List on it. The box on it shows the total of the records in it.

Choose one from the list, its detail will show in information column on the right.

We can add items to list or adjust the width and position of every displayed item. Operation method: Right click on title of display items, then a menu pops up, please choose items to display in it. Drag boundary of item title to adjust the width of the item. Drag the item title to adjust position of the item.

Click on the title, a upwards or downwards arrow occurs by it, meaning that the list is ordered by the content of that item.

- Details

The detail of the selected record of the case list displays in it. The details can be modified in its edit box, and click "Save" to save the modification to the archive.

Click green arrow button on its left to hide the details or advanced search engine, and to display case list only. When it is hide, click the green arrow button on the right of the case

list, the details or advanced search engine can be showed again.

- Quick Enter terms

Quick Enter Terms can be applied to edit “Medications”, “Notes” etc. To see how to use it, please refer to you can use quick term input dialogue box, please refer to “5.3 report edit”.

- Advanced search

The content of Advanced Search displays at the same position as details, click button "Advanced Search..." to switch between the two items. Advanced search engine is used for searching cases with complicated condition, the result of search will displays in case list.

- Open

Open the highlight case, and enter report edit interface. Double click on the record to open will do the same.

- History

Click this button, a dialogue box of Print History as Fig.5-34 pops up, you can view the record or print it out again.

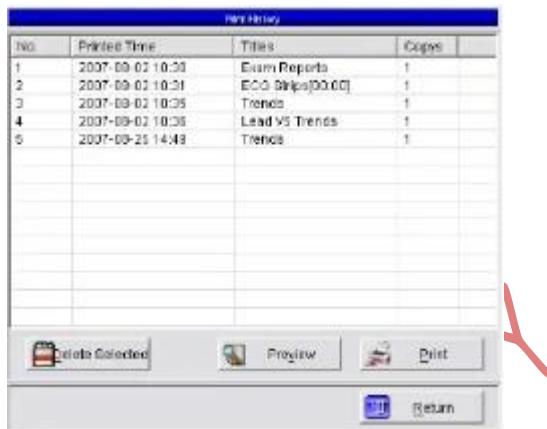


Fig.5-34 Print History

- **Browse**

Click this button, to open the folder which includes report file of the appointed case as Fig.5-35, you can view saved report file. If the selected case does not have report picture saved, a notify window pops up.

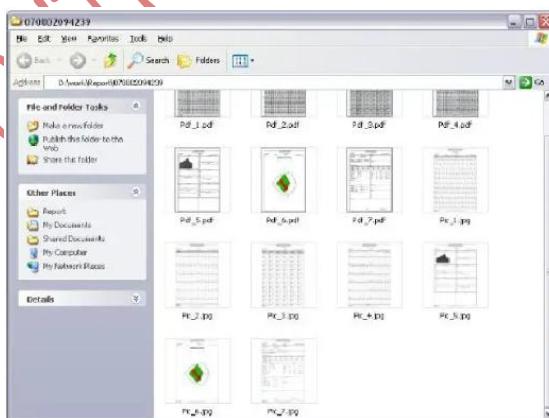


Fig.5-35 View Report file

- Delete

Click this button to delete appointed case, detailed steps is as follows:

1. Choose the case to delete from case list.
2. Click the button "Delete", a dialog box (as Fig.5-36) for confirming pops up, choose "Yes" to delete the appointed case, choose "No" to cancel this operation.

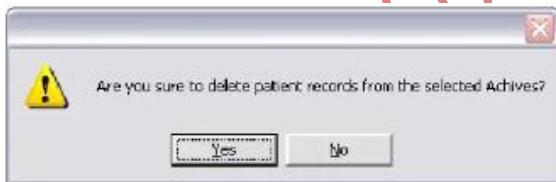


Fig.5-36 Delete Case

⚠ Notice: When you choose to delete case, the corresponding data file is deleted, however the case item is not clear away, it is set as deleted.

⚠ Notice: The deleted case is beyond retrieve, please think over before delete case.

- Export

Click this button, the selected archive will be export as an exterior file, operating steps are as follows:

1. Choose the case to export in the case list.

2. Click "Export" button, a dialog box as Fig.5-37 pops up for choosing the folder to save the export file:

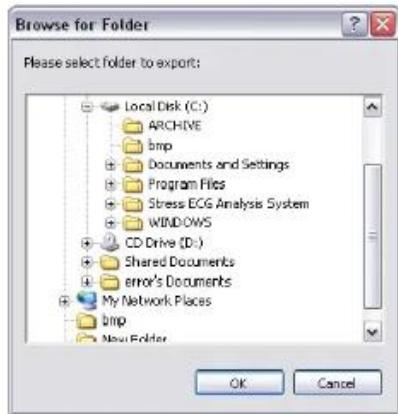


Fig.5-37 Export Archive 1

Choose the folder to save the export file, then click button "OK"

3. Then a dialog box for export process pops up as Fig.5-38, the export result displays in the window, after

finished export, please close the window.

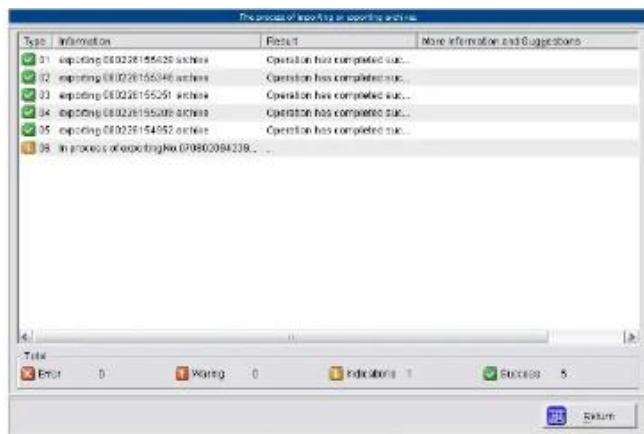


Fig.5-38 Export archive 2

⚠️ Notice: The export file is Compressed file of case information and case data, so it takes smaller disk space than original case.

- Import

Click "Import" button, then import file that exported before or other files of the same kind to current case database.

Detailed steps are as follows:

1. Click "Import" button, a dialog box for selecting the file to import pops up (as Fig.5-39), choose the file to import, then click button "Import".

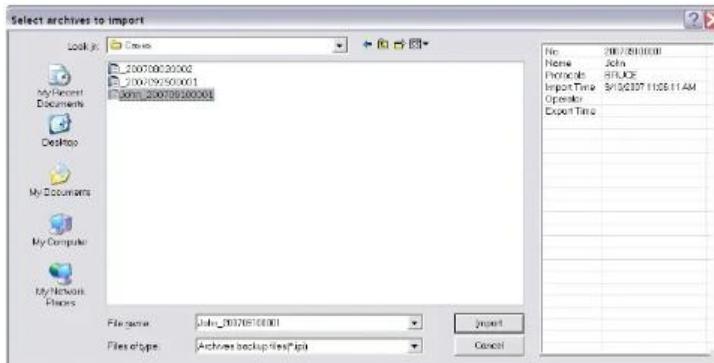


Fig.5-39 Import archive-select file

2. If current case data base has contained the case to import, a dialogue box as Fig.5-40 pops up:

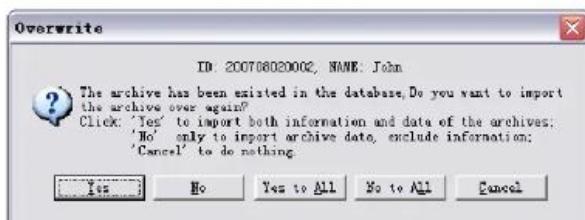


Fig.5-40 Import archive-wheter to overwrite

Click button "YES" to import and instead former case history.
Click button "NO", then this file will not be imported, choose
"Yes To All", all repeated case in data base will be instead,
choose "No To All", all repeated input file will not be imported,
choose "Cancel" to cancel this input operation.

3. Then a dialog box of import process pops up as Fig.5-38, the dialog box includes result of import, after finished import, please close the dialog box.

- Return

Click this button, exit archive management, back to main interface.

5.10 Protocol

On interface of protocol management (as Fig.5-41), you can create, modify, import/export, delete exercise protocol or choose an exercise protocol as current exercise protocol.

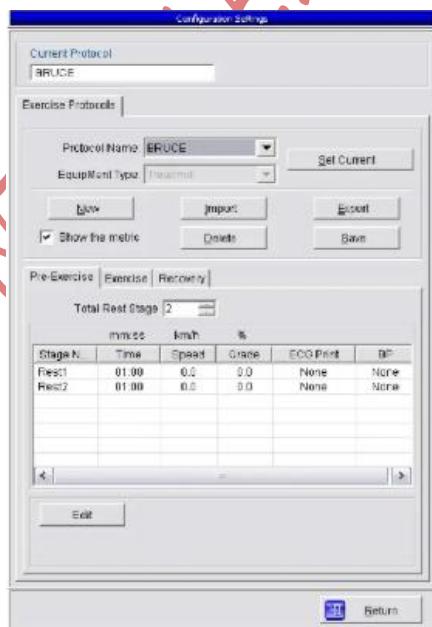


Fig.5-41 Protocol Management

This item includes:

- Set Current

Select an exercise scheme from existent protocol name list, and click button "Set Current", then the selected exercise protocol becomes current default protocol. This exercise protocol will be default protocol when you begin a new test, until you set another exercise protocol as default.

- New
 - You can create a new protocol in this item, detailed steps as follows:
 1. Click button "New", the interface of "Protocol management" will be in the state as Fig.5-42. Enter a protocol name in edit box of "Protocol Name", then choose an equipment type from the list of "Equipment Type", and click "OK", then the new protocol is created.
⚠️ Notice: Now a new protocol is created, however stages are not setup, so the creation process is not finished, and how to set the stages will be described following.
 2. Choose attribute page of "Pre-exercise" 2, Set "Total rest stage" manually, then click "Edit" button to modify pre-

exercise Stage Name, Time, Speed, Gradient, ECG Print and BP etc. The details will be explained following.



Fig.5-42 New Protocol

3. Please choose attribute page of "Exercise", then modify settings of exercise stage.

Modification of total phase number will add or delete some exercise stages. To set a stage, first, you should choose it, then click button "Edit" or double click on the stage, as Fig.5-43, you can modify value of every item in stage edit area underside. After finishing modification, click button "OK" to save it.



Fig.5-43 Set exercise stage

4. Please choose attribute page of “Recovery” and modify stage settings in it. The modification process is similar to exercise stage modification.
5. Click button “Save”, to save the new protocol, then the creation of a new protocol finished.

- Import/Export

It is similar to archive import/export. The detailed settings of an exercise scheme can be export to a disk file, and it can be import when needed.

- Delete

You can delete some protocols from current system. Choose the protocol to delete in the protocol list, then click button "Delete".

- Save

Save the new protocol or modified protocol.

- Edit

Detailed steps of edit protocol as follows:

1. Choose protocol to modify from the “Protocol Name” list.
2. Choose attribute page of "Pre-Exercise", "Exercise" or "Recovery", to modify settings of any stage in the items. The modification process is similar to "New" in this chapter.
3. After modification, click button “Save” to save the modified protocol.

5.11 Configuration Settings

This item provides configuration settings function for the system, its interface is as Fig.5-44:

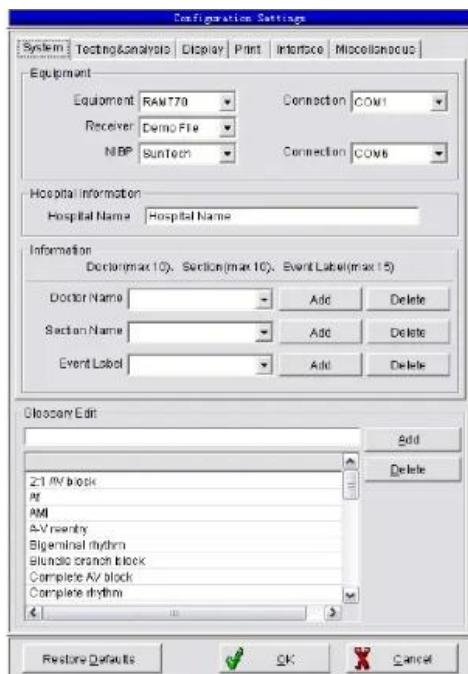


Fig. 5-44 Configuration Settings

This chapter include: system settings, Testing & analysis settings, Display settings, print settings, interface settings, Miscellaneous settings and glossary edit function.

5.11.1 System Settings

This item includes settings of equipment, hospital information, pre-define information, as Fig.5-44, details is as follows:

- Equipment: name of equipment which is linked and using, you must choose correct name for exercise equipment, which is linked with computer, and insure link port setup correct on the right of this item.
- Receiver: type of receive equipment includes: Wireless Receiver, Wired Receiver, Demo File and Wi-Fi Receiver

⚠️ Notice: Demo file is for demonstrating product function. If Demo file is selected, during sampling data process, source of ECG data is from demonstration file, but not acquired from wireless/wired receiver equipment.

- NIBP: when you choose and set exercise blood pressure equipment, choose “manual” meaning that blood pressure measure equipment is unnecessary or inexistence. If you choose other item, you must make sure link port on right side of this item setup correctly.
- Hospital name: please input hospital name, and this hospital name will be printed in report title.
- Doctor name: add or delete doctor name for information pre-setup.
- Section name: add or delete section office name for information pre-setup.

- Event label: add or delete event label for information pre-setup.

Above pre-setup information will appear in drop list of relevant content, you can choose it from drop list instead of manual input. Method to pre-setup is as follows:

Add: input appointed information on the edit box on the left, click button "Add", the information will be added to the pre-setup information list.

Delete: choose the information to delete from pre-setup information list on left side, then click "Delete" button, the appointed information will be removed from pre-setup information list.

5.11.2 Testing and Analysis Settings

This item includes settings for “Testing and analysis”, as Fig.5-45

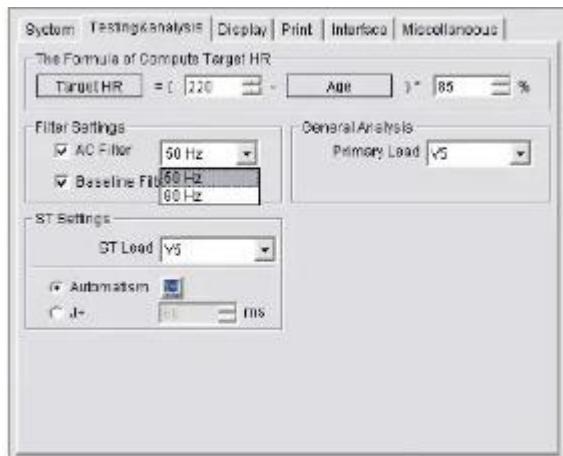


Fig.5-45 Testing and analysis settings

- The Formula of Compute Target HR: input parameter to decide target heart rate calculation formula
- Filter Settings: choose digital filter for sampling process.
Choose AC filter to wipe off power-line interference.
Choose EMG Filter to reduce EMG interface.
Choose baseline filter to reduce baseline excursion.
- General analysis: choose a primary analysis lead, as the primary lead for QRS complex identification.
- ST settings
ST lead: choose a primary lead for ST segment analysis.

Next two options are mode of appointed ST segment analysis:

1. Automatism: Automatically adjust ST measure point position. Namely according to different heart rate, choose different measure point, its position can be set in setup window for ST measure position (as Fig.5-46), which occurs after click the button on the right of the item.
2. J+X ms: ST measure point fix as X millisecond after point J, X is decided by content on its right side.

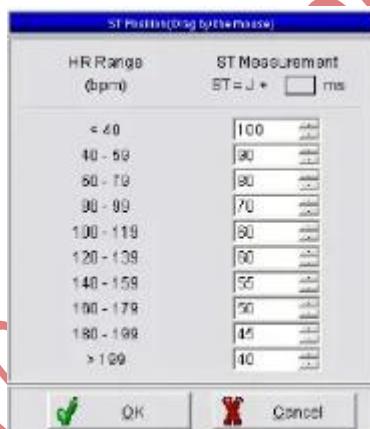


Fig. 5-46 Automatic ST analysis settings

5.11.3 Display Settings

Interface of display settings is as Fig.5-47, including:

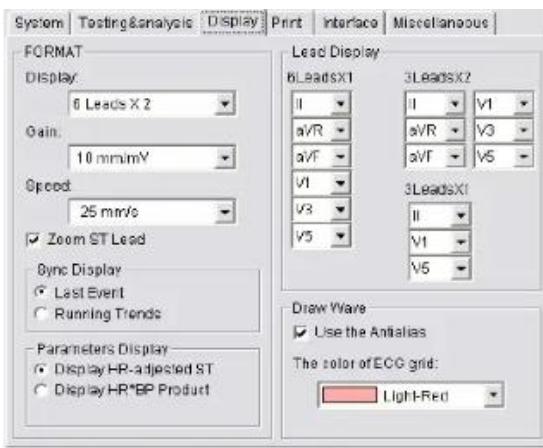


Fig.5-47 Display Settings

- Display: choose display mode for ECG during sampling process from the drop down list, which includes 3 leads (3leads1row), 6 leads (6leads1row), 6 leads (3leads2rows) 12 leads (12leads1row), 12 leads (6leads2row). In above setup, 3leads1row, 3leads2row and 6leads1row is set according to "display leads option" on right side of this interface.
- Gain: ECG gain in sampling
- Speed: ECG speed in sampling
- Leads display: Set the display style of the leads appointed in "Display"
- Zoom ST lead: When it is checked, ST level and the R-ST Angle will be displayed, as the magnified ST primary analysis lead is displayed.

- Sync display: when you choose magnified ST main analysis lead, you can choose display last event or running trends below central section of screen. If "Running Trends" is checked, the heart rate Trends and ST Trends will be displayed. If "Last Event" is checked, the ECG waveform of the last event will be displayed.
- Use the antialias: If this item is checked, ECG waveform on screen will be displayed in high fidelity mode, which emphasize detail, avoid distortion because of physical speciality of screen.
- The color of ECG grid: you can choose different color for ECG background.

5.11.4 Print Settings

Print setting interface is as Fig.5-48, including:

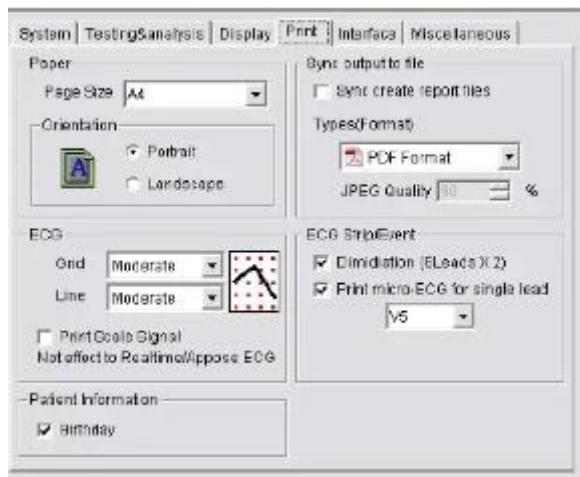


Fig.5-48 Print Settings

- Paper size: the paper type for print report.
- Orientation: direction of print report.
- Sync create report files: If this item is checked, the report file will be created during printing report. Format of report file is decided by "Types (format)".
- Type (format): choose format for report file.
- JPEG quality: this item decides picture quality when create JPEG format picture.
- Grid: choose thickness of print ECG background.
- Print scale signal: Print out the scale signal, when the ECG except the online ECG and average ECG is printing.

- Birthday: Select this item, the birthday will show at the print report.
- Dimidiation: Check this, and the printed ECG of segment and event will be displayed in the format of 6 leads * 2.
- Print micro-ECG for single lead: Check this item, then a micro single lead ECG waveform will be printed under ECG segment and event ECG. This single lead is decided by appointed lead in drop list under this item.

5.11.5 Interface Settings

Interface settings window is as Fig.5-49, it includes the following items:

- Use Tooltips for Buttons: open the Tooltips function. Hover the mouse on a command button for a second, a prompt of the function of the button pops out.
- Default Input Method: turn on auto-switch input method, this item is checked, you can choose input method, which you want from its drop down list.
- Language: choose a language for the system.
- Transparent windows: Transparency of glossary input window, print window, Case info window and the pop-up window during testing can be setup here. If any of above items

is checked, the slider is enabled to adjust the transparency, to the right means rise the transparency.

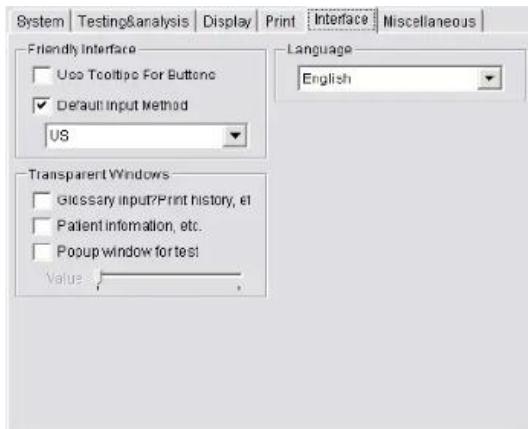


Fig.5-49 Interface Settings

5.11.6 Miscellaneous Settings

Miscellaneous settings is as Fig.5-50, including:

- Units: choose units for length, weight and speed.
- BORG: choose BORG grade.
- Date format: choose format for date

YYYY – represent year, for example 1979

MM – represent month in Arabic numerals, for example 03

MMM – represent month in English abbreviation, for example Mar

DD – represent date, for example 26

- Auto BP measure tip according to protocol: check this item, and the system will pop up blood pressure input dialogue box, according to set of exercise protocol.
- Redden "RECOVERY" When HR Reach the Target HR: after you choose this item, during sampling process, if heart rate reach target heart rate, button "Recovery" will be highlighted.
- Auto Test Finish Tip When Recovery Time Reach: Check this item, during the recovery stage, if total recovery time reaches the appointed time, a notify window pops up automatically.

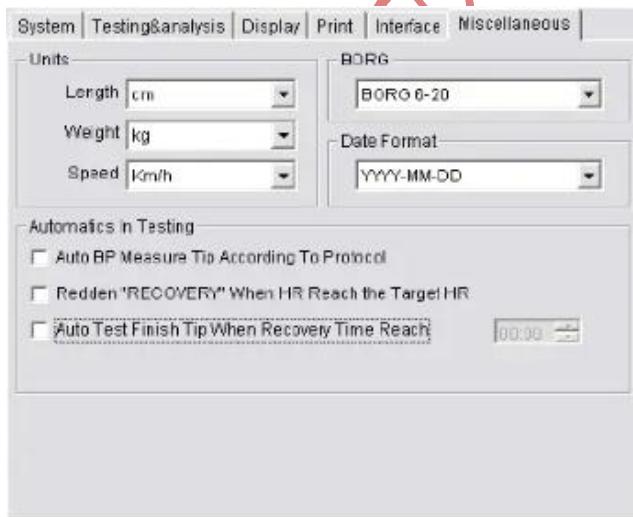


Fig.5-50 Miscellaneous Settings

5.11.7 Glossary Edit

Interface of glossary edit is as underside of Fig.5-41, it has function as follows:

- Add: Enter the term to add in the edit box above glossary list, then click button "Add" on its right side, the new term will be added to glossary list.
- Delete: Choose the term to delete, then click button "Delete", the selected term will be deleted.

Content in glossary list can be used for quick enter terms dialog box of archive management, report edit.

This operation will predigest fill of case remark and conclusion. Detailed operation you can refer to relevant content in "Archive management" and "Report Edit".

5.12 Utilities

The Utilities supplied some software tools for use, include: Import and Export Archives and Equipment manager. The interface is as Fig.5-51:

Import And Export Archives: Import archive which store in disk into Stress ECG analysis System, and export archive to file or other system.

Equipment Manager: Equipment Manager can be used to test all parameter of the treadmill, and be able to manual control it, make sure it work normally.



Fig.5-51 Utilities

Chapter 6 Instructions to Attendants

This chapter is about how to use the system for an exercise stress test. It includes following content:

Patient skin dispose

Electrode emplace

Exercise scheme and option setup

New Exam

Patient information input

Formal sampling

Final report

During practice of operation, you can modify some operation of setup according to your requirement.

6.1 Patient Skin Dispose

Patient skin dispose is very important to a successful exercise stress test. Proper treat to skin and correct lead position is benefit to electron signal effectively, and you can get a good test result. Proper treat to skin can restrain myoelectric interfere and baseline excursion. You can get high quality screen display and print.

Steps for skin treat are as follows:

- Shave hair on the position for lead electrode, keep well contact between skin and electrode.
- Scrape a X graph on skin with sand paper, get rid of keratose on skin. During scrape, you should avoid overexert.
- Clean skin with alcohol
- Brush alcohol from skin with tampon, then skin is mild red.

- Put the center of electrode aim at "X" graph, press electrode forcibly, cling it to skin. During this operation, you should avoid press the center of electrode, this may affect conductivity of electrode.

⚠ Notice: Stickup of electrode is basic of sampling exercise stress ECG signal. Quality of electrode, stick position and method will affect quality of ECG signal. Please read this chapter thoroughly before first operation.

6.2 Electrode Emplace

Electrode emplace position is as Fig.6-1

V1 – 4th intercostal space right border of sternum

V2 – 4th intercostal space left border of sternum

V3 – in the middle of line between point V2 and point V4

V4 – intersect of left clavicle midline and 5th intercostal space

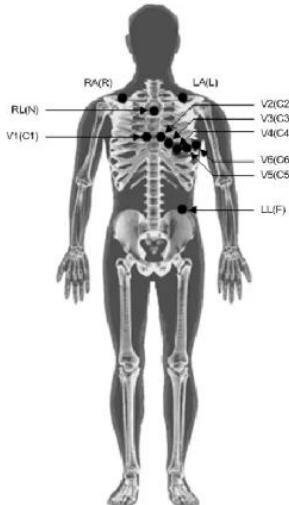
V5 – in the middle of line between point V2 and point V4

V6 – left armpit midline, correspond to V4 level

LA and RA – on left and right clavicle, keep far away from main muscle

LL – under V6, near waist. LL position can be adjusted to avoid interference from waistband or others.

RL – on sternum manubrium



SPY

Fig.6-1 Map of Electrode Emplace

~~CONFIDENTIAL~~
⚠ Notice: Choose electrode of high quality, stick it onto relevant part of skin, then link with lead. To avoid electrode falling off, you can fix it with medicine adhesive tape (notice that length of adhesive tape be long enough. It should be arc, but not beeline).

~~CONFIDENTIAL~~
⚠ Notice: You must not stick leads with ordinary adhesive tape, it will erode lead, reduce its longevity.

After emplace electrode, you can enter Stress ECG Analysis System.

6.3 Exercise Protocol and Configuration Setting

If it is first time to run the system, or you want to change current exercise protocol, please click button "Protocol", enter protocol settings dialog box (refer to 5.10 Protocol settings). You can modify exercise protocol or choose an exercise protocol, then click button "Return" to main interface.

If it is first time to run the system, or you want to change current configuration settings, please click "Settings" button, enter configuration settings dialog box (refer to 5.11 option setup). You can modify configuration settings, then click "OK" button back to main interface.

⚠ Notice: Before new exam run, please insure following item:

1. You have choose available exercise protocol for system.
2. You have set essential items in configuration settings, these essential items include:
 - ❖ Exercise equipment and its link port
 - ❖ Receiver type
 - ❖ Exercise blood pressure equipment and its link port
 - ❖ Hospital name

6.4 New Exam

Click button "New Exam" on main interface, system will enter ECG signal sampling mode. You can see pre-sample interface display on screen. The ECG in this interface include following examine:

1. Check for correct link and position of electrode and leads.
2. Check for interfere and base line excursion of ECG waveform.
3. If the patient can not exercise smoothly on the Exercise device, Patient may do adaptability practice under advice of doctor during Pre-Sample stage, avoiding the interfere caused by abnormal exercise in the sampling course.

⚠️ Notice: Now, the patient should be directed to exercise on the device in the right way. When the patient exercise on the treadmill, he should keep his hand on the armrest of the treadmill. One foot move with the track, the other move to the opposite direction during exercise.

When the patient adapt himself to the treadmill, please remind him to keep his head raised and his body erectly forward. Please tell the patient keep his hand and arms easy as his daily walk.

Please direct the patient to reduce movement of his body other than his legs, and keep shorter distance between his body and the front end of the treadmill. The movement of patients other than his legs may bring strong interfere signals.

⚠ Notice: If necessary, you should dispose patient's skin or emplace again. (refer to 6.1 treat with patient skin and 6.2 electrode emplace)

6.5 Input of Patient's Information

When you are satisfied with the Pre-Sample ECG waveform, please click "START" button and start real data sampling operation. Before formal memorize experiment data, you should input the patient individual information. Patient data input dialogue box will pop up, you can input patient's information in it.

Necessary information:

Target heart rate

Suggested item:

Case ID

Name

Other information can be input or modified after finishing sampling operation.

After information input, click “OK” button, system will begin exercise stress test, and enter formal sampling stage.

6.6 Formal Data Sample

When you enter formal data sample stage, the stage name, time, heart rate and ST level is displayed on screen real time.

⚠️ Notice: Pay attention to red warning information or notify, when you can not understand its meanings and insure patient's security, please stop exercise stress experiment.

⚠️ Notice: Under emergency, you can stop running machine by click emergency stop button.

During pre-exercise stage:

- Define event label, mark patient's ECG signal under repose state.
- Measure and record patient's blood pressure level under repose state. If measure blood pressure manual, please input its result after measure.
- At this time set waveform display mode and format option.

After entering the exercise stages, the treadmill will run with the set speed and gradient.

⚠ Notice: You must insure patient keep his/her leg on running machine, and patient's security when entering exercise phase.

After get target of exercise phase, click "RECOVERY" button, enter recovery stage. Otherwise when current exercise scheme all finished, system will enter recovery stage automatically.

When you get the target of recovery stage, click "FINISH" Button to end current exercise stress ECG test, system will enter report edit interface automatically. Or when recovery stage of current exercise is finished, system will end exercise stress ECG test automatically, enter report edit phase.

⚠ Notice: These operations can be operated during every phase of formal collect process

Blood pressure measure and input

Define event label

Modify ST segment primary analysis lead

Set waveform compare

Modify setup of display and format

Print ECG at real time



: Refer to instruction manual/booklet.

6.7 Final Report

In the interface of report edit, you can browse test data, input conclude reason, symptom and the conclusion of this exercise stress ECG test. You can print it after report edit.

Entering static state review interface, choose and print representative ECG waveform.

Entering trend review interface, choose and print representative trend chart.

Chapter 7 Attention

7.1 Installation

- Please read install and start chapter of user manual carefully before install this equipment, or you may damage the equipment.
- Accessories supplied by other company may not put into use.
- You must make sure computer is compatible before install software, or the software does not work or display abnormally.

7.2 Action

- Insure leads are correct before start.
- Indoor temperature should be above 16°C, avoid myoelectric interfere because of cold.
- Dispose patient's skin according to this user manual before emplace electrode.
- Position of electrode, refer to 6.2 electrode emplace.
- You should use one-off ECG electrode, and its quality up to YY/T 0196-94 regulation.
- Every time before operation, operator should check whether leads is physical damaged, if so, please insure reliability of leads in time.

- Do not put electronic equipment near this equipment, or it will make strong electronic interference.
- We suggest AA alkaliescence battery for emission equipment (for instance: FUJIAN NANFU battery). Please take the batteries out in time after exercise stress test.
- During the exam, be sure that two or more medical personal is at present, one of them wholly keep an eye on the state of the patient, and be ready for emergency dispose at any moment.
- In the room which the product is installed, Please keep defibrillator and the blood-pressure meter in stock, and also some necessary first aid medicine kept present and in period of valid.
- The product can not apply to the heart directly, the ECG signal come from the body surface. And also the product can not use along with high frequency operation device.

7.3 Maintenance

- This equipment should avoid high temperature, solarization, humidification, dust, and bump, please cover up the equipment with dustproof cover after operation.

- Core of leads is damageable, please avoid pull forcibly or wring when using it.
- Every time after testing for 50 persons, leads should be cleaned by cotton fabric. Detergent contain alcohol must not be used, it will reduce longevity of lead, please disinfect leads with ultraviolet radiation light.
- If this system unused for a long time, please take receive equipment down, take battery out of emission equipment, and keep the equipments in appropriate way, avoid damage to equipment.

7.4 Transport and Storage

- The packed product can be transported by ordinary conveyance, and can not be transported mixed with toxic, harmful, corrosive material.
- Storage: The packed product should be stored in room with no corrosive gases and good ventilation. Temperature: -20°C ~ +55°C; Relative Humidity: ≤90%.

7.5 Disposal of Product Scrap

The disposal of packaging materials, waste battery and end-of-life device should obey the local laws and regulations, and user should treat the scrapped products and materials

properly according to the laws and regulations, and try to support the classification and recycling work.

7.6 Others

The device associated circuit schematics and critical parts list are only available to authorized service station or maintenance personnel, who is responsible for maintenance of the device.

The device belongs to measuring instrument. User should send the device to national designated inspection institution for inspection according to the requirements of the national metrological verification procedure. The device shall be inspected at least once per year, and all the accessories should be inspected and maintained at least once every six months.

Chapter 8 Malfunction and Maintenance

Malfunction	Malfunction Reason	Repair Method
There is only beeline in collected waveform	One of leads falls off	Please link leads and electrode again
	Connection between lead and recorder is not proper.	Please check the insert pin, whether it is crook, rupture or missing, if it is in good condition, please connect it in correct way.
There are strong interfere and many artifacts in one of the lead's ECG waveform, ECG record signal quality is low.	The leads are not fixed properly.	Please fix leads in correct way according to chapter 6.2.
	One-off electrode quality is low, which leads contact	Please instead the electrode with one-off

ECG-8000S Stress Analysis System
Maintenance

Malfunction and

	badly, waveform is disordered	so is electrode of high quality.
There are strong interfere in waveform. ECG signal quality is low	Dispose of skin is not proper or position of electrode is wrong.	Please dispose skin and emplace electrode again according to chapter 6.1 and 6.2, then continue the test.
	Upper limbs of patient are overload, which make muscle-electricity be with error overmuch.	Please guide patient do exercise according to chapter 6.6
	Room temperature is too low, patient's muscle tremble, which causes muscle-electricity interfere.	Please make the room temperature above 16°C.

ECG-8000S Stress Analysis System
Maintenance

Malfunction and

	One-off electrode be with low-quality, or conductor glue is dry because of long deposit.	Please choose new electrode of high quality.
One lead ECG waveform extent is little, which leads difficulty in analysis.	Lead is ruptured.	Please change lead.
Emission equipment does not work after battery be installed, indicator light is dark	Batteries are out of power, (or one of batteries is out of power), please test the battery with multimeter.	Please change it with new battery.
	Battery and reed does not contact entirely well, some brand of battery's anode (+) is too low, so after installation, it does not work.	Please change other brand battery, or set sheet metal between anode and reed.

ECG-8000S Stress Analysis System Malfunction and Maintenance

	The installation direction of battery is wrong.	Please install battery in right way.	
Printer does not work	Link between computer and printer does not connect properly, or cable of printer is broken.	Please change cable of print, then connect it again.	<i>REMOVED COPY</i>
	Hardware of printer is broken.	Please change printer.	
	Soft ware of printer is broken.	Please install driver again.	
The ECG waveform or the background grid of the printed report is not clear	Wrong print settings	Reset the printer, and close options of self-regulation and ink cost saving mode etc.	
	The ink cartridge of printer is lack of ink	Change the ink cartridge	

ECG-8000S Stress Analysis System
Maintenance

Malfunction and

There is something wrong with printed report, typeface is disordered.	Distinguish rate of printer is setup in wrong mode.	Please set the print list with printer management, then print it again.	
	Driver of printer does not match with printer.	Uninstall the wrong driver, and install correct driver.	
Sampling, the check of the exercise equipment or BP instrument failed	Equipment power off or switch of the power is off	Turn on the power before put the system into use.	
	The connect port is wrongly setted.	Reset the connect port in option settings	
	The connect route between the equipment and the host	Change the connect route between the equipment and	

ECG-8000S Stress Analysis System Maintenance

Malfunction and

	computer is failure.	the host computer
	The equipment itself is somewhere wrong.	Maintain the equipment.

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Chapter 9 Precautions

Do not operate the instrument on parts of human body with wounds and do not perform measurements on parts with wounds on the surface.

9.1 This device is not intended to act directly on the human heart. If this device is used with cardiac defibrillator or other electric stimulating devices at the same time, single-use electrode and ECG lead cables with defibrillation-proof function should be selected. It is better not to use this device with other electric stimulating devices at the same time. If it is necessary, there must be professional technician guiding on the scene, and the selected accessories should be designated by our company.

The resistance of lead cable with defibrillation-proof function protection function is about $10K\Omega$.

9.2 When the electrocardiograph is used together with a high-frequency electrosurgical knife, the ECG electrode should be kept away from the contact of the electrosurgical knife to prevent burns and burning of the electrode wires caused by high-frequency sparks.

9.3 When the electrocardiograph is used together with a defibrillator, the operator should avoid contact with the patient or the sickbed. The defibrillation electrode should not directly touch the ECG electrode to prevent sparks from burning the device and the patient.

9.4 Please do not use the electrocardiograph in the environment that is interfered by high-power device such as high-voltage cables, X-rays, ultrasonic machines and electrizer, away from emission sources such as mobile phones.

9.5 When other devices are connected with this ECG instrument, they must be Type I devices which accord with IEC60601-1. Because the total amount of leakage current may hurt patients, the monitoring of leakage current is carried out and taken charge by connect devices.

9.6 Notes related to EMC

The device complies with the safety standards for medical electrical equipment or system electromagnetic compatibility in IEC60601-1-2. Electromagnetic environments exceeding the IEC60601-1-2 standard may cause harmful interference to the device or prevent the device from performing its intended function or degrade

its performance. Therefore, if there is a phenomenon that does not match its function during use, be sure to confirm and eliminate adverse effects before continuing to use it. Corresponding precautions for this situation are given in this manual.

- The device or system should not be used near or stacked with other devices. If it must be used near or stacked with other devices, it should be observed and verified that the device is working normally under the configuration it is using.
- In addition to transducers and cables sold by the manufacturer of the device or system as spare parts for internal components, use of accessories and cables outside of the regulations may result in reduced muscle-building emitted by device or system and interference immunity.
- Effect from radiated electromagnetic waves:

The use of a mobile phone may affect the operation of the device. When installing medical electrical equipment, be sure to remind people around the device to turn off mobile phones and small radios

- Effect from shock and conduction electromagnetic waves:

High frequency noise from other equipment can enter the device through the AC socket. Please identify the source of noise, if possible, stop using the equipment. If the equipment can not be deactivated, use noise cancellation equipment or take other measures to reduce the impact.

- Effect from static electricity:

Static electricity in a dry environment(indoor) may affect the operation of the device, especially in winter. Before using the device, humidify the indoor air or discharge the static electricity from the cable and ECG record personnel.

- Effect from thunder and lightning:

If there is thunder and lightning nearby, it may cause a voltage surge in the device. If you are concerned about danger, pull the AC power plug and use the internal power supply.

9.7 Do not allow the patient and patient-connected lead cables and electrodes to come into contact with other conductor parts, including the earth or a hospital bed.

9.8 Maintenance or repair to the device or accessory is not allowed during using.

Meaning of Symbols

	Type CF equipment, with defibrillation-proof function
	Waste disposal symbol. This symbol indicates that electrical and electronic equipment waste cannot be disposed of as unsorted municipal waste and must be recycled separately
	Atmospheric pressure limit
<i>(Red 'CONTINUE' watermark)</i>	Humidity limit
	Temperature limit
	This way up
	Fragile, handle with care
	Keep away from the rain
	Stacking limit by number

	Manufacturer
	Date of manufacturer
	Serial number
	Caution: refer to the accompanying document
IP22	International protection

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ELECTROCARDIOGRAPH STRESS ANALYSIS SYSTEM

ECG-8000S

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